



#11

<110> YU, LEI

<120> MU OPIOID RECEPTOR: COMPOSITIONS AND METHODS

<130> INDA:002USD1

<140> 09/841,720

<141> 2001-04-24

<150> 08/120,601

<151> 1993-09-13

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<170> PatentIn Ver. 2.1

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Met Asp Ser Ser Thr Gly Pro
1 5
ggg aac acc agc gac tgc tca gac ccc tta gct cag gca agt tgc tcc 282
Gly Asn Thr Ser Asp Cys Ser Asp Pro Leu Ala Gln Ala Ser Cys Ser
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cca gca cct ggc tcc tgg ctc aac ttg tcc cac gtt gat ggc aac cag 330
Pro Ala Pro Gly Ser Trp Leu Asn Leu Ser His Val Asp Gly Asn Gln
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Ser Asp Pro Cys Gly Leu Asn Arg Thr Gly Leu Gly Gly Asn Asp Ser
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ctg tgc cct cag acc ggc agc cct tcc atg gtc aca gcc att acc atc 426
Leu Cys Pro Gln Thr Gly Ser Pro Ser Met Val Thr Ala Ile Thr Ile
60 65 70
atg gcc ctc tac tct atc gtg tgt gta gtg ggc ctc ttc gga aac ttc 474

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| | | | | | | | | | | | | | | | | | |
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| Leu | Val | Met | Tyr | Val | Ile | Val | Arg | Tyr | Thr | Lys | Met | Lys | Thr | Ala | Thr | | |
| | | 90 | | | | | 95 | | | | | 100 | | | | | |
| aac | atc | tac | att | ttc | aac | ctt | gct | ctg | gca | gac | gcc | tta | gcg | acc | agt | 570 | |
| Asn | Ile | Tyr | Ile | Phe | Asn | Leu | Ala | Leu | Ala | Asp | Ala | Leu | Ala | Thr | Ser | | |
| | 105 | | | | | 110 | | | | | 115 | | | | | | |
| aca | ctg | ccc | ttt | cag | agt | gtc | aac | tac | ctg | atg | gga | aca | tgg | ccc | ttc | 618 | |
| Thr | Leu | Pro | Phe | Gln | Ser | Val | Asn | Tyr | Leu | Met | Gly | Thr | Trp | Pro | Phe | | |
| | 120 | | | | 125 | | | | | 130 | | | | | 135 | | |
| gga | acc | atc | ctc | tgc | aag | atc | gtg | atc | tca | ata | gat | tac | tac | aac | atg | 666 | |
| Gly | Thr | Ile | Leu | Cys | Lys | Ile | Val | Ile | Ser | Ile | Asp | Tyr | Tyr | Asn | Met | | |
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| ttc | acc | agc | ata | ttc | acc | ctc | tgc | acc | atg | agc | gtg | gac | cgc | tac | att | 714 | |
| Phe | Thr | Ser | Ile | Phe | Thr | Leu | Cys | Thr | Met | Ser | Val | Asp | Arg | Tyr | Ile | | |
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| gct | gtc | tgc | cac | cca | gtc | aaa | gcc | ctg | gat | ttc | cgt | acc | ccc | cga | aat | 762 | |
| Ala | Val | Cys | His | Pro | Val | Lys | Ala | Leu | Asp | Phe | Arg | Thr | Pro | Arg | Asn | | |
| | | 170 | | | | 175 | | | | | | 180 | | | | | |
| gcc | aaa | atc | gtc | aac | gtc | tgc | aac | tgg | atc | ctc | tct | tct | gcc | atc | ggc | 810 | |
| Ala | Lys | Ile | Val | Asn | Val | Cys | Asn | Trp | Ile | Leu | Ser | Ser | Ala | Ile | Gly | | |
| | 185 | | | | | 190 | | | | | 195 | | | | | | |
| ctg | cct | gta | atg | ttc | atg | gca | acc | aca | aaa | tac | agg | cag | ggg | tcc | ata | 858 | |
| Leu | Pro | Val | Met | Phe | Met | Ala | Thr | Thr | Lys | Tyr | Arg | Gln | Gly | Ser | Ile | | |
| | 200 | | | | 205 | | | | | 210 | | | | | 215 | | |
| gat | tgc | acc | ctc | acg | ttc | tcc | cac | cca | acc | tgg | tac | tgg | gag | aac | ctg | 906 | |
| Asp | Cys | Thr | Leu | Thr | Phe | Ser | His | Pro | Thr | Trp | Tyr | Trp | Glu | Asn | Leu | | |
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| ctc | aaa | atc | tgt | gtc | ttt | atc | ttc | gct | ttc | atc | atg | ccg | atc | ctc | atc | 954 | |
| Leu | Lys | Ile | Cys | Val | Phe | Ile | Phe | Ala | Phe | Ile | Met | Pro | Ile | Leu | Ile | | |
| | | | 235 | | | | | 240 | | | | | 245 | | | | |
| atc | act | gtg | tgt | tac | ggc | ctg | atg | atc | tta | cga | ctc | aag | agc | gtt | cgc | 1002 | |
| Ile | Thr | Val | Cys | Tyr | Gly | Leu | Met | Ile | Leu | Arg | Leu | Lys | Ser | Val | Arg | | |
| | | 250 | | | | | 255 | | | | | 260 | | | | | |
| atg | cta | tcg | ggc | tcc | aaa | gaa | aag | gac | agg | aat | ctg | cgc | agg | atc | acc | 1050 | |
| Met | Leu | Ser | Gly | Ser | Lys | Glu | Lys | Asp | Arg | Asn | Leu | Arg | Arg | Ile | Thr | | |
| | | 265 | | | | 270 | | | | | 275 | | | | | | |
| cgg | atg | gtg | ctg | gtg | gtc | gtg | gct | gta | ttt | atc | gtc | tgc | tgg | acc | ccc | 1098 | |
| Arg | Met | Val | Leu | Val | Val | Ala | Val | Phe | Ile | Val | Cys | Trp | Thr | Pro | | | |
| | 280 | | | | 285 | | | | 290 | | | | | 295 | | | |

atc cac atc tac gtc atc atc aaa gcg ctg atc acg att cca gaa acc 1146
 Ile His Ile Tyr Val Ile Ile Lys Ala Leu Ile Thr Ile Pro Glu Thr
 300 305 310

aca ttt cag acc gtt tcc tgg cac ttc tgc att gct ttg ggt tac acg 1194
 Thr Phe Gln Thr Val Ser Trp His Phe Cys Ile Ala Leu Gly Tyr Thr
 315 320 325

aac agc tgc ctg aat cca gtt ctt tac gcc ttc ctg gat gaa aac ttc 1242
 Asn Ser Cys Leu Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe
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 Lys Arg Cys Phe Arg Glu Phe Cys Ile Pro Thr Ser Ser Thr Ile Glu
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cag caa aac tcc act cga gtc cgt cag aac act agg gaa cat ccc tcc 1338
 Gln Gln Asn Ser Thr Arg Val Arg Gln Asn Thr Arg Glu His Pro Ser
 360 365 370 375

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 Thr Ala Asn Thr Val Asp Arg Thr Asn His Gln Leu Glu Asn Leu Glu
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gca gaa act gct cca ttg ccc taactgggtc tcacaccatc cagaccctcg 1437
 Ala Glu Thr Ala Pro Leu Pro
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ctaagcttag aggcgcgcat ctacgtggaa tcaggttgct gtcaggggtgt gtgggaggct 1497

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 35 40 45

Gly Leu Gly Gly Asn Asp Ser Leu Cys Pro Gln Thr Gly Ser Pro Ser
 50 55 60

Met Val Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val

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| Thr Lys Met Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu | 100 | 105 | 110 |
| Ala Asp Ala Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr | 115 | 120 | 125 |
| Leu Met Gly Thr Trp Pro Phe Gly Thr Ile Leu Cys Lys Ile Val Ile | 130 | 135 | 140 |
| Ser Ile Asp Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Cys Thr | 145 | 150 | 155 |
| Met Ser Val Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu | 165 | 170 | 175 |
| Asp Phe Arg Thr Pro Arg Asn Ala Lys Ile Val Asn Val Cys Asn Trp | 180 | 185 | 190 |
| Ile Leu Ser Ser Ala Ile Gly Leu Pro Val Met Phe Met Ala Thr Thr | 195 | 200 | 205 |
| Lys Tyr Arg Gln Gly Ser Ile Asp Cys Thr Leu Thr Phe Ser His Pro | 210 | 215 | 220 |
| Thr Trp Tyr Trp Glu Asn Leu Leu Lys Ile Cys Val Phe Ile Phe Ala | 225 | 230 | 235 |
| Phe Ile Met Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Ile | 245 | 250 | 255 |
| Leu Arg Leu Lys Ser Val Arg Met Leu Ser Gly Ser Lys Glu Lys Asp | 260 | 265 | 270 |
| Arg Asn Leu Arg Arg Ile Thr Arg Met Val Leu Val Val Val Ala Val | 275 | 280 | 285 |
| Phe Ile Val Cys Trp Thr Pro Ile His Ile Tyr Val Ile Ile Lys Ala | 290 | 295 | 300 |
| Leu Ile Thr Ile Pro Glu Thr Thr Phe Gln Thr Val Ser Trp His Phe | 305 | 310 | 315 |
| Cys Ile Ala Leu Gly Tyr Thr Asn Ser Cys Leu Asn Pro Val Leu Tyr | 325 | 330 | 335 |
| Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Glu Phe Cys Ile | 340 | 345 | 350 |
| Pro Thr Ser Ser Thr Ile Glu Gln Gln Asn Ser Thr Arg Val Arg Gln | 355 | 360 | 365 |

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 agcctaccta gtccgcagca ggccttcagc accatggaca gcagcaccgg cccaggggaac 240
 accagcgact gctcagaccc cttagctcag gcaagttgct cccagcacc tggctcctgg 300
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 Met Arg Ser Glu Pro His
 1 5

cgg gct tgg cgg gaa cga cag cct gtg ccc tca gac cgg cag ccc ttc 404
 Arg Ala Trp Arg Glu Arg Gln Pro Val Pro Ser Asp Arg Gln Pro Phe
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cat ggt cac agc cat tac cat cat ggc cct cta ctc tat cgt gtg tgt 452
 His Gly His Ser His Tyr His His Gly Pro Leu Leu Tyr Arg Val Cys
 25 30 35

agt ggg cct ctt cgg aaa ctt cct ggt cat gta tgt gat tgt aag ata 500
 Ser Gly Pro Leu Arg Lys Leu Pro Gly His Val Cys Asp Cys Lys Ile
 40 45 50

cac caa aat gaa gac tgc cac caa cat cta cat ttt caa cct tgc tct 548
 His Gln Asn Glu Asp Cys His Gln His Leu His Phe Gln Pro Cys Ser
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 Gly Arg Arg Leu Ser Asp Gln Tyr Thr Ala Leu Ser Glu Cys Gln Leu
 75 80 85

cct gat ggg aac atg gcc ctt cgg aac cat cct ctg caa gat cgt gat 644
 Pro Asp Gly Asn Met Ala Leu Arg Asn His Pro Leu Gln Asp Arg Asp
 90 95 100

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| ctc aat aga tta cta caa cat gtt cac cag cat att cac cct ctg cac | 692 |
| Leu Asn Arg Leu Leu Gln His Val His Gln His Ile His Pro Leu His | |
| 105 110 115 | |
| cat gag cgt gga ccg cta cat tgc tgt ctg cca ccc agt caa agc cct | 740 |
| His Glu Arg Gly Pro Leu His Cys Cys Leu Pro Pro Ser Gln Ser Pro | |
| 120 125 130 | |
| gga ttt ccg tac ccc ccg aaa tgc caa aat cgt caa cgt ctg caa ctg | 788 |
| Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn Arg Gln Arg Leu Gln Leu | |
| 135 140 145 150 | |
| gat cct ctc ttc tgc cat cgg tct gcc tgt aat gtt cat ggc aac cac | 836 |
| Asp Pro Leu Phe Cys His Arg Ser Ala Cys Asn Val His Gly Asn His | |
| 155 160 165 | |
| aaa ata cag gca ggg gtc cat aga ttg cac cct cac gtt ctc cca ccc | 884 |
| Lys Ile Gln Ala Gly Val His Arg Leu His Pro His Val Leu Pro Pro | |
| 170 175 180 | |
| aac ctg gta ctg gga gaa cct gct caa aat ctg tgt ctt tat ctt cgc | 932 |
| Asn Leu Val Leu Gly Glu Pro Ala Gln Asn Leu Cys Leu Tyr Leu Arg | |
| 185 190 195 | |
| ttt cat cat gcc gat cct cat cat cac tgt gtg tta cgg cct gat gat | 980 |
| Phe His His Ala Asp Pro His His His Cys Val Leu Arg Pro Asp Asp | |
| 200 205 210 | |
| ctt acg act caa gag cgt tcg cat gct atc ggg ctc caa aga aaa gga | 1028 |
| Leu Thr Thr Gln Glu Arg Ser His Ala Ile Gly Leu Gln Arg Lys Gly | |
| 215 220 225 230 | |
| cag gaa tct gcg cag gat cac ccg gat ggt gct ggt ggt cgt ggc tgt | 1076 |
| Gln Glu Ser Ala Gln Asp His Pro Asp Gly Ala Gly Gly Arg Gly Cys | |
| 235 240 245 | |
| att tat cgt ctg ctg gac ccc cat cca cat cta cgt cat cat caa agc | 1124 |
| Ile Tyr Arg Leu Leu Asp Pro His Pro His Leu Arg His His Gln Ser | |
| 250 255 260 | |
| gct gat cac gat tcc aga aac cac att tca gac cgt ttc ctg gca ctt | 1172 |
| Ala Asp His Asp Ser Arg Asn His Ile Ser Asp Arg Phe Leu Ala Leu | |
| 265 270 275 | |
| ctg cat tgc ttt ggg tta cac gaa cag ctg cct gaa tcc agt tct tta | 1220 |
| Leu His Cys Phe Gly Leu His Glu Gln Leu Pro Glu Ser Ser Ser Leu | |
| 280 285 290 | |
| cgc ctt cct gga tgaaaacttc aagcgatgct tcagagagtt ctgcatccca | 1272 |
| Arg Leu Pro Gly | |
| 295 | |
| acctcgtcca cgatcgaaca gcaaaactcc actcgagtcc gtcagaacac tagggaacat | 1332 |
| ccctccacgg ctaatacagt ggatcgaact aaccaccagc tagaaaatct ggaggcagaa | 1392 |

actgtccat tgcctaact ggggtctcaca ccatccagac cctcgctaag cttagaggcc 1452
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35 40 45

Val Cys Asp Cys Lys Ile His Gln Asn Glu Asp Cys His Gln His Leu
50 55 60

His Phe Gln Pro Cys Ser Gly Arg Arg Leu Ser Asp Gln Tyr Thr Ala
65 70 75 80

Leu Ser Glu Cys Gln Leu Pro Asp Gly Asn Met Ala Leu Arg Asn His
85 90 95

Pro Leu Gln Asp Arg Asp Leu Asn Arg Leu Leu Gln His Val His Gln
100 105 110

His Ile His Pro Leu His His Glu Arg Gly Pro Leu His Cys Cys Leu
115 120 125

Pro Pro Ser Gln Ser Pro Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn
130 135 140

Arg Gln Arg Leu Gln Leu Asp Pro Leu Phe Cys His Arg Ser Ala Cys
145 150 155 160

Asn Val His Gly Asn His Lys Ile Gln Ala Gly Val His Arg Leu His
165 170 175

Pro His Val Leu Pro Pro Asn Leu Val Leu Gly Glu Pro Ala Gln Asn
180 185 190

Leu Cys Leu Tyr Leu Arg Phe His His Ala Asp Pro His His His Cys
195 200 205

Val Leu Arg Pro Asp Asp Leu Thr Thr Gln Glu Arg Ser His Ala Ile

| | | | | |
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| 210 | | 215 | | 220 |
| Gly Leu Gln Arg Lys Gly Gln Glu Ser Ala Gln Asp His Pro Asp Gly | | | | |
| 225 | | 230 | | 235 |
| Ala Gly Gly Arg Gly Cys Ile Tyr Arg Leu Leu Asp Pro His Pro His | | | | |
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| Leu Arg His His Gln Ser Ala Asp His Asp Ser Arg Asn His Ile Ser | | | | |
| | 260 | | 265 | 270 |
| Asp Arg Phe Leu Ala Leu Leu His Cys Phe Gly Leu His Glu Gln Leu | | | | |
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| Pro Glu Ser Ser Ser Leu Arg Leu Pro Gly | | | | |
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Ala Ile Ala Ile Thr Ala Leu Tyr Ser Ala Val Cys Ala Val Gly Leu
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Leu Gly Asn Val Leu Val Met Phe Gly Ile Val Arg Tyr Thr Lys Leu
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Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala

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| Thr | Trp | Pro | Phe | Gly | Glu | Leu | Leu | Cys | Lys | Ala | Val | Leu | Ser | Ile | Asp |
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| Tyr | Tyr | Asn | Met | Phe | Thr | Ser | Ile | Phe | Thr | Leu | Thr | Met | Met | Ser | Val |
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| Asp | Arg | Tyr | Ile | Ala | Val | Cys | His | Pro | Val | Lys | Ala | Leu | Asp | Phe | Arg |
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| Ser | Gly | Val | Gly | Val | Pro | Ile | Met | Val | Met | Ala | Val | Thr | Gln | Pro | Arg |
| | | | 180 | | | | | 185 | | | | | | 190 | |
| Asp | Gly | Ala | Val | Val | Cys | Met | Leu | Gln | Phe | Pro | Ser | Pro | Ser | Trp | Tyr |
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| Trp | Asp | Thr | Val | Thr | Lys | Ile | Cys | Val | Phe | Ile | Phe | Ala | Phe | Val | Val |
| | | | 210 | | | | 215 | | | | | | | 220 | |
| Pro | Ile | Leu | Ile | Ile | Thr | Val | Cys | Tyr | Gly | Leu | Met | Leu | Leu | Arg | Leu |
| | | | | | | | 230 | | | | 235 | | | | 240 |
| Arg | Ser | Val | Arg | Leu | Leu | Ser | Gly | Ser | Lys | Glu | Lys | Asp | Arg | Ser | Leu |
| | | | | | | | 245 | | | | | | | 255 | |
| Arg | Arg | Ile | Thr | Arg | Met | Val | Leu | Val | Val | Val | Gly | Ala | Phe | Val | Val |
| | | | 260 | | | | | 265 | | | | | | 270 | |
| Cys | Trp | Ala | Pro | Ile | His | Ile | Phe | Val | Ile | Val | Trp | Thr | Leu | Val | Asp |
| | | | 275 | | | | 280 | | | | | | | 285 | |
| Ile | Asn | Arg | Arg | Asp | Pro | Leu | Val | Val | Ala | Ala | Leu | His | Leu | Cys | Ile |
| | | | 290 | | | | 295 | | | | 300 | | | | |
| Ala | Leu | Gly | Tyr | Ala | Asn | Ser | Ser | Leu | Asn | Pro | Val | Leu | Tyr | Ala | Phe |
| | | | 305 | | | | 310 | | | | 315 | | | | 320 |
| Leu | Asp | Glu | Asn | Phe | Lys | Arg | Cys | Phe | Arg | Gln | Leu | Cys | Arg | Thr | Pro |
| | | | | | | | 325 | | | | 330 | | | 335 | |
| Cys | Gly | Arg | Gln | Glu | Pro | Gly | Ser | Leu | Arg | Arg | Pro | Arg | Gln | Ala | Thr |
| | | | 340 | | | | | 345 | | | | | | 350 | |
| Thr | Arg | Glu | Arg | Val | Thr | Ala | Cys | Thr | Pro | Ser | Asp | Gly | Pro | Gly | Gly |
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| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Ala | Ala | Asp | Gly | Met | Glu | Glu | Pro | Gly | Arg | Asn | Leu | Ser | Gln | Asn |
| | | | 35 | | | | | 40 | | | | 45 | | | |
| Gly | Thr | Leu | Ser | Glu | Gly | Gln | Gly | Ser | Ala | Ile | Leu | Ile | Ser | Phe | Ile |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Tyr | Ser | Val | Val | Cys | Leu | Val | Gly | Leu | Cys | Gly | Asn | Ser | Met | Val | Ile |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Tyr | Val | Ile | Leu | Arg | Tyr | Ala | Lys | Met | Lys | Thr | Ala | Thr | Asn | Ile | Tyr |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ile | Leu | Asn | Leu | Ala | Ile | Ala | Asp | Glu | Leu | Leu | Met | Leu | Ser | Val | Pro |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Phe | Leu | Val | Thr | Ser | Thr | Leu | Leu | Arg | His | Trp | Pro | Phe | Gly | Ala | Leu |
| | | 115 | | | | | | 120 | | | | 125 | | | |
| Leu | Cys | Arg | Leu | Val | Leu | Ser | Val | Asp | Ala | Tyr | Asn | Met | Phe | Thr | Ser |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Ile | Tyr | Cys | Leu | Thr | Val | Leu | Ser | Val | Asp | Arg | Tyr | Val | Ala | Val | Val |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| His | Pro | Ile | Lys | Ala | Ala | Arg | Tyr | Arg | Arg | Pro | Thr | Val | Ala | Lys | Val |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Val | Asn | Leu | Gly | Val | Trp | Val | Leu | Ser | Leu | Leu | Val | Ile | Leu | Pro | Ile |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Val | Val | Phe | Ser | Arg | Thr | Ala | Ala | Asn | Ser | Asp | Gly | Thr | Val | Ala | Cys |
| | | 195 | | | | | | 200 | | | | 205 | | | |
| Asn | Met | Leu | Met | Pro | Glu | Pro | Ala | Gln | Arg | Trp | Leu | Val | Gly | Phe | Val |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Tyr | Thr | Phe | Leu | Met | Gly | Phe | Leu | Leu | Pro | Val | Gly | Ala | Ile | Cys |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Leu | Cys | Tyr | Val | Leu | Ile | Ile | Ala | Lys | Met | Arg | Met | Val | Ala | Leu | Lys |
| | | | | 245 | | | | | 250 | | | | | 255 | |

Ala Gly Trp Gln Gln Arg Lys Arg Ser Glu Arg Lys Ile Thr Leu Met
260 265 270

Val Met Met Val Val Met Val Phe Val Ile Cys Trp Met Pro Phe Tyr
275 280 285

Val Val Gln Leu Val Asn Val Phe Ala Glu Gln Asp Asp Ala Thr Val
290 295 300

Ser Gln Leu Ser Val Ile Leu Gly Tyr Ala Asn Ser Cys Ala Asn Pro
305 310 315 320

Ile Leu Tyr Gly Phe Leu Ser Asp Asn Phe Lys Arg Ser Phe Gln Arg
325 330 335

Ile Leu Cys Leu Ser Trp Met Asp Asn Ala Ala Glu Glu Pro Val Asp
340 345 350

Tyr Tyr Ala Thr Ala Leu Lys Ser Arg Ala Tyr Ser Val Glu Asp Phe
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Gln Pro Glu Asn Leu Glu Ser Gly Gly Val Phe Arg Asn Gly Thr Cys
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Ala Ser Arg Ile Ser Thr Leu
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<211> 369

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<213> RAT

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Met Glu Leu Thr Ser Glu Gln Phe Asn Gly Ser Gln Val Trp Ile Pro
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Ser Pro Phe Asp Leu Asn Gly Ser Leu Gly Pro Ser Asn Gly Ser Asn
20 25 30

Gln Thr Glu Pro Tyr Tyr Asp Met Thr Ser Asn Ala Val Leu Thr Phe
35 40 45

Ile Tyr Phe Val Val Cys Val Val Gly Leu Cys Gly Asn Thr Leu Val
50 55 60

Ile Tyr Val Ile Leu Arg Tyr Ala Lys Met Lys Thr Ile Thr Asn Ile
65 70 75 80

Tyr Ile Leu Asn Leu Ala Ile Ala Asp Glu Leu Phe Met Leu Gly Leu
85 90 95

Pro Phe Leu Ala Met Gln Val Ala Leu Val His Trp Pro Phe Gly Lys
100 105 110

Ala Ile Cys Arg Val Val Met Thr Val Asp Gly Ile Asn Gln Phe Thr

| | | | | |
|---|-----|-----|-----|-----|
| 115 | | 120 | | 125 |
| Ser Ile Phe Cys Leu Thr Val Met Ser Ile Asp Arg Tyr Leu Ala Val | | | | |
| 130 | | 135 | | 140 |
| Val His Pro Ile Lys Ser Ala Lys Trp Arg Arg Pro Arg Thr Ala Lys | | | | |
| 145 | | 150 | | 155 |
| Met Ile Asn Val Ala Val Trp Gly Val Ser Leu Leu Val Ile Leu Pro | | | | |
| | 165 | | 170 | 175 |
| Ile Met Ile Tyr Ala Gly Leu Arg Ser Asn Gln Trp Gly Arg Ser Ser | | | | |
| | 180 | | 185 | 190 |
| Cys Thr Ile Asn Trp Pro Gly Glu Ser Gly Ala Trp Tyr Thr Gly Phe | | | | |
| | 195 | | 200 | 205 |
| Ile Ile Tyr Ala Phe Ile Leu Gly Phe Leu Val Pro Leu Thr Ile Ile | | | | |
| | 210 | | 215 | 220 |
| Cys Leu Cys Tyr Leu Arg Ile Ile Ile Lys Val Lys Ser Ser Gly Ile | | | | |
| | 225 | | 230 | 235 |
| Arg Val Gly Ser Ser Lys Arg Lys Lys Ser Glu Lys Lys Val Thr Arg | | | | |
| | | 245 | 250 | 255 |
| Met Val Ser Ile Val Val Ala Val Phe Ile Phe Cys Trp Leu Pro Phe | | | | |
| | 260 | | 265 | 270 |
| Tyr Ile Phe Asn Val Ser Ser Val Ser Val Ala Ile Ser Pro Thr Pro | | | | |
| | 275 | | 280 | 285 |
| Ala Leu Lys Gly Met Phe Asp Phe Val Val Ile Leu Thr Tyr Ala Asn | | | | |
| | 290 | | 295 | 300 |
| Ser Cys Ala Asn Pro Ile Leu Tyr Ala Phe Leu Ser Asp Asn Phe Lys | | | | |
| | 305 | | 310 | 315 |
| Lys Ser Phe Gln Asn Val Leu Cys Leu Val Lys Val Ser Gly Ala Glu | | | | |
| | | 325 | 330 | 335 |
| Asp Gly Glu Arg Ser Asp Ser Lys Gln Asp Lys Ser Arg Leu Asn Glu | | | | |
| | 340 | | 345 | 350 |
| Thr Thr Glu Thr Gln Arg Thr Leu Leu Asn Gly Asp Leu Gln Thr Ser | | | | |
| | 355 | | 360 | 365 |
| Ile | | | | |